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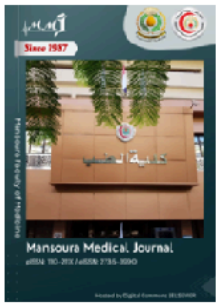

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THE STUDY OF THE EFFECT OF SCLEROTHERAPY VERSUS BAND LIGATION ON THE ESOPHAGEAL MOTILITY AFTER ERADICATION OF ESOPHAGEAL VARICES.

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ABSTRACT

Background: In cirrhotic patients, the presence of esophageal varices could have a mechanical effect on the motility of the esophagus and the integrity of the lower esophageal sphincter. Endoscopic management of esophageal varices, either by sclerotherapy or band ligation, was suggested to have an effect on esophageal motility and lower sphincter pressure, due to damage of intima, mucosa and submucosa of veins. The aim of this study is to compare between sclerotherapy and band ligation as an effect on esophageal motility and lower sphincter pressure after eradication of varices.

Methods : ninety six patients with upper gastrointestinal bleeding from esophageal varices (proved endoscopically) were included in this study. They were divided into two groups: Group I ; included 46 patients, received sclerotherapy and group II, included 50 patients received band ligation .They were followed every two weeks endoscopically, till complete eradication of varices. Stationary esophageal manometry was done to all patients before endoscopic treatment and after complete eradication of varices.

Results : No significant difference between both groups as regard age, gender, etiology and severity of liver disease, laboratory findings, grading and number of varices. In sclerotherapy group there is high significant decrease in lower sphincter pressure

(P< 0.0001), and velocity of wave (P< 0.007), than before treatment, but no significant change in lower sphincter relaxation, amplitude and duration of waves in the different parts of the esophagus. Also in band ligation group, there is high significant decrease in lower sphincter pressure (P< 0.0001), but no significant change in lower sphincter relaxation, velocity , amplitude and duration of waves.

Conclusion : Endoscopic variceal ligation is a good alternative method to injection sclerotherapy in treatment of esophageal varices. Both techniques lead to lowering on lower sphincter pressure, but without dyspeptic symptoms or reflux, and this effect is transient, continue for no longer time.

INTRODUCTION

Patients with liver cirrhosis, without esophageal varices, appear to have intact esophageal motility[1]. The presence of varices could have a mechanical effect on the motility of the esophagus and the integrity of the lower esophageal sphincter (LES).

Consequently, some have suggested that impaired esophageal motility in cirrhotics with varices might interfere with the esophageal acid-clearance mechanism, resulting in mucosal injury that could induce variceal rupture[2]. In other hand, the presence of bulging varices in the distal portion of the esophagus appears to have little effect on the basal LES pressure. Patients with high-grade varices did not differ in resting LES pressure from normal healthy subjects, so some can't speculate that large varices have a mechanical protective effect on the LES[3] . Further qualitative evaluation of esophageal transit time in cirrhotics with varices, using scintigraphy, revealed prolonged transit time in 47% of patients[4] and others found minor prolongation of transit time between patients with non bleeding non treated esophageal varices compared to patients with no esophageal varices[5] . Sclerotherapy is a popular technique for treatment of esophageal varices hemorrhage, which was suggested to have an effect on esophageal motility and LES pressure, most motility abnormalities post sclerotherapy were observed in the distal one-third to one-half of the esophagus, probably because of the location of prominent variceal columns and the technique[6] . Some studies observed complete disappearance of peristalsis in the distal 5cm of the esophagus[7,8] , while others found

that there is no manometric changes between the controls and sclerotherapy patients who did not complaining from dysphagia while in patients with dysphagia there is no change in LES pressure but there is decrease in the percentage of deglutitive peristaltic contraction[5] , also the changes in the esophageal transit time that occurred between the period immediately before sclerotherapy and three months after variceal eradication is reversible[9].

Esophageal band ligation, is another endoscopic technique for treatment of variceal bleeding, with significantly lower complication rate and need fewer endoscopy sessions and less time for obliteration of varices[10] . Band ligation appears to have no significant effect on LES pressure and relaxation while there is mild reduction on amplitude of motor waves in the mid and distal esophagus but duration of waves was not significantly affected[11]. This is due to ligation cause damage limited to mucosa and submucosa, without involvement of the muscle layers[12] .

The aim of this study is to compare between the effects of injection sclerotherapy and band ligation on esophageal motility and LES pressure after variceal eradication.

PATIENTS AND METHODS

From December 2001 to March 2003, ninety six patients with history of upper gastrointestinal bleeding from esophageal varices (endoscopically proved), were admitted to Mansoura University Hospital in Medical Hepatology and Gastroenterology unit. The inclusion criteria were 1) active bleeding or history of esophageal variceal bleeding "proved endoscopically" , 2) liver cirrhosis or fibrosis and 3) age between 40 and 66 years. The exclusion criteria were 1) upper gastrointestinal bleeding due to gastric or fundal varices, 2) gastric or duodenal ulcer, 3) Association of hepatocellular carcinoma or other malignances, 4) hepatorenal syndrome and 5) any systemic disease can affect the motility as diabetes, myopathy or collagen disorders. The etiology of liver disease was based on clinical examination, laboratory findings and liver biopsy was done in some cases. It was post-bilharzial fibrosis in 36 patients (37.5%), post-hepatitic in 13 patients (13.5%) and mixed cirrhosis in 47 patients (48.9%). The definition of esophageal variceal bleeding included 1) active spurting or oozing of

blood from esophageal varix during endoscopy, 2) a clot or blackish ulcer was seen on the varix 3) no other cause of upper gastrointestinal bleeding. Resuscitation was begun immediately after admission, and then endoscopy was done to prove the esophageal variceal bleeding as an etiology. The patients were randomized into two groups: group I; included 46 patients (36 male, 10 female, mean age 47±12.4) , treated by injection sclerotherapy, and group II; included 50 patients (37 male, 13 female ; mean age 41 ±11.5), treated by band ligation. After discharge, further sessions at 2 weeks intervals were done till complete obliteration of varices.

Stationary esophageal manomerty :

It was done twice. Firstly after resuscitation of patient and became hemodynamically stable, secondly after obliteration of esophageal varices. Stationary manometry is performed while the patient is awake and without sedation. The patient should fast at least 4-6 hours before the study. All medications that can affect esophageal motility have to be stopped 24 hours before as (nitrates, anti-cholinergic drugs, calcium channel blockers, sedatives and prokinetic drugs).

A water infusion system is used which consists of a manometric catheter, an infusion pump, pre amplifier / amplifier, and finally a phyiograph. The esophageal manometric catheter was introduced through the nasal opening, down to the stomach, the pulled gently upwards to reach the LES and the body of the esophagus. The phyiograph receives the electrical signals from the transducers and the chart recorder produces the final printed tracing. The stimulus is usually a wet swallow which has been found to be more effective than a dry swallow. so the patient is instructed to drink sips of water from time to time while recording .

Statistical Methods :

The mean SD were parameters to describe the central tendency dispersion of continuous variables. Uparied t-test and Mann- Whitney tests were used for analysis of the difference between two groups. Association between categorical variables was determined by cross-tabulation and Chi-Square test with continuity correction using Fisher-Exact test.

RESULTS

A total of 96 patients (73 male, 23 female) were included in this study due to esophageal varices bleeding. They were divided into two groups according to the line of endoscopic management, group I, 46 patients received sclerotherapy and group II, 50 patients received band ligation. Table (1) shows demographic data of both groups, where there is no significant difference between them as regard age, gender, etiology of cirrhosis, severity of liver disease, laboratory findings and number of blood units transfused per patient. Table (2) shows no significant difference between both groups as regard grading and number of varices while there was highly significant difference ($p < 0.0001$) between band ligation group and sclerotherapy group which much less in number of sessions and time needed for obliteration. As regard the complications, there is high significant occurrence of chest pain in group I (78.3%), than group II (14%) $p<0.0001$, while there is significant increase in ulcer occurrence (60%, 13.04%) , recurrence of varices (14.3 % , 4.34%), rebleeding rate (10%, 4.34%) and failure to complete obliteration (16%, 0%) in band ligation group, than sclerotherapy group respectively.

The total number of deaths was 5 patients in group I , 3(6.5%) of them died due to rebleeding and the other two (4.3%) died due to liver cell failure, in comparison to 3 cases died in group II, one (2%) died due to rebleeding and the other two (4%) died due to liver cell failure.

Table (3) shows there was no significant difference in group I patients as regard : LES relaxation, amplitude of wave and duration of wave in different parts of the esophagus , while there was highly significant decrease in LES pressure after treatment ($P<0.0001$), and significant decrease in velocity of wave after sclerotherapy ($P< 0.007$).

Table (4) shows there was no significant difference in group II patients as regard : LES relaxation, velocity of wave, amplitude and duration of wave in all parts of the esophagus, while there was highly significant decrease in LES pressure than before band ligation ($P<0.0001$).

Table (1) : Basic patients characteristics.

Variant	Group I n = 46	Group II n = 50	X^2	P
Age (mean ± SD)	47 ± 12.4	41 ± 11.5	0.74	0.39*
Sex (M/F)	36/10	37/13	0.46	0.51
Etiology of liver disease.				
Schistosomal (36)	20 (43.5%)	16 (32%)	2.3	0.13
Post-hepatitic (13)	7 (15.5%)	6 (12%)	1.5	0.47
Mixed cirrhosis (47)	24 (52.3%)	23 (46%)	1.46	0.23
Child- Pugh class				
A	26 (56.5%)	29 (58%)		
B	12 (26.1%)	14 (28%)	1.03	0.6
C	8 (17.4%)	7 (14%)		
Laboratory data				
Albumin (g/dL)	3.48 ± 0.68	3.63 ± 0.7	0.8	0.43*
Bilirubin (mg/dL)	1.26 ± 0.83	1.11 ± 0.46	0.47	0.64*
ALT (i.u)	53.77 ± 30.6	45.2 ± 21.84	2.14	0.06*
Prothrombin time (sec.)	14.33 ± 2.25	15.2 ± 2.83	1.31	0.2*
Hemoglobin (gm %)	9.39 ± 1.4	9.15 ± 1.45	0.66	0.51*
Platelet (cmm)	155 ± 76.7	153.8 ± 91.6	0.05	0.96*
No. of blood units transfused/ patient	1.1 ± 0.2	1.6 ± 1.3	0.72	0.47*

Chi-Square test **Upaired t-test : ***

Table (2): Analysis of the difference in endoscopic findings and complications in the two studied groups.

Variant	Group I n = 46	Group II n = 50	t-value	P
Endoscopic findings				
Total no of varices	4.07 ± 0.52	3.97 ± 0.56	0.72	0.48
No of varices G II	0.47 ± 0.68	0.37 ± 0.56	0. 62	0.54
No of varices G III	0.83 ± 0.75	0.6 ± 0.4	1.1	0.28
No of varices G IV	2.71 ± 1.11	2.97 ± 1.03	0.73	0.47
No of sessions needed	4.67 ± 1.21	3.3 ± 0.95	4.85	#< 0.0001
Time taken till complete obliteration in weeks	11.03 ± 4.4	7.2 ± 3.17	3.87	#< 0.0001
Complications				
Fever	8 (17.4 %)	9 (18 %)	0.08	0.77*
Chest pain	36 (78.3 %)	7 (14 %)	5.16	# 0. 001*
Ulcer	6 (13.4 %)	30 (60 %)	6.21	# 0.0001*
Recurrence	2 (4.34 %)	7 (14 %)	4.08	# 0. 03*
Rebleeding	2 (4.34 %)	5 (10 %)	1.46	0.32*
Failure to complete obliteration	0 (0 %)	8 (16 %)	9.37	# 0.001*
Mortality				
Due to rebleeding	3 (6.5 %)	1 (2 %)	0.35	0.84
Due to liver cell failure	2 (4.3 %)	2 (4 %)	0.22	0.64

Upaired t-test Chi-Square test : * **Test of significance : #**

Table (3): Impact of sclerotherapy on esophageal motility:

Variant	Before sclerotherapy	After sclerotherapy	t-value	p
LES pressure	17.6 ± 3.88	14.16 ± 3.67	9.36	#<0.0001
LES relaxation	97.4 ± 3.59	97.48± 4.54	0.15	0.88
Velocity of wave	4.3 ± 0.97	3.77 ± 0.93	2.9	#0.007
Amplitude of wave in proximal esophagus	37.6 ± 12.9	38.4 ± 10.1	0.15	0.89
Amplitude of wave in mid-esophagus	41.1 ± 17.5	89.83 ± 14.3	0.15	0.88
Amplitude of wave in distal esophagus	43± 23.1	46 ± 21.9	1.45	0.58
Duration of wave in proximal esophagus	3.5 ± 0.61	2.79 ± 0.66	1.677	0.10
Duration of wave in mid- esophagus	2.63 ± 1.53	2.95 ± 1.96	1.1	0.13
Duration of wave in distal esophagus	2.86 ± 0.61	3.09 ± 0.66	1.56	0.13

Paired t-test **Test of significance : #**

Table (4): Impact of band ligation on esophageal motility:

Variant	Before band ligation	After band ligation	t-value	p
LES pressure	18.52 ± 3.25	15.26 ± 3.65	4.96	#<0.0001
LES relaxation	97.3 ± 3.21	97.84 ± 1.7	0.75	0.46
Velocity of wave	3.91 ± 1.1	3.66 ±0.75	1.29	0.21
Amplitude of wave in proximal esophagus	43.23 ± 15.8	44.13 ±22.6	0.37	0.72
Amplitude of wave in mid-esophagus	47.87 ± 16.7	45.8 ± 17.7	1.23	0.23
Amplitude of wave in distal esophagus	52.73 ± 25.75	49.75 ± 24.57	1.27	0.23
Duration of wave in proximal esophagus	2.73 ± 0.75	2.75 ± 0.57	0.22	0.83
Duration of wave in mid- esophagus	2.56 ± 1.32	2.92 ± 1.7	1.5	0.15
Duration of wave in distal esophagus	2.83 ± 0.48	2.9 ± 0.71	0.62	0.54

Paired t-test **Test of significance : #**

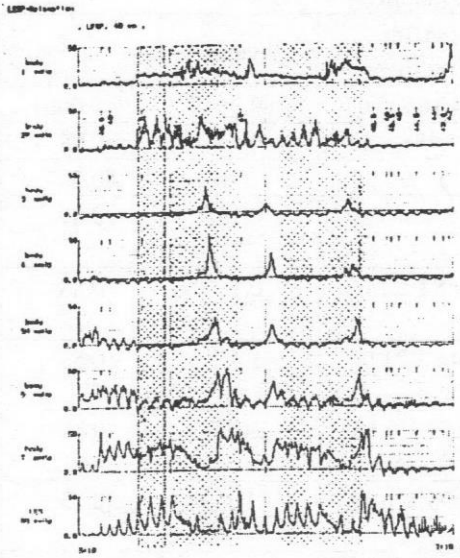

Fig. (1) : Shows esophageal motility before injection sclero therapy.

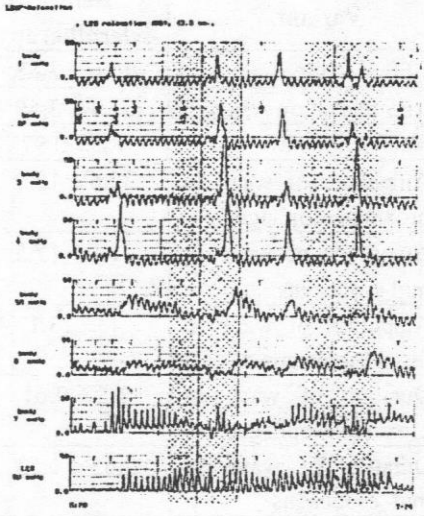

Fig. (2) : Shows esophageal motility after injection sclero therapy.

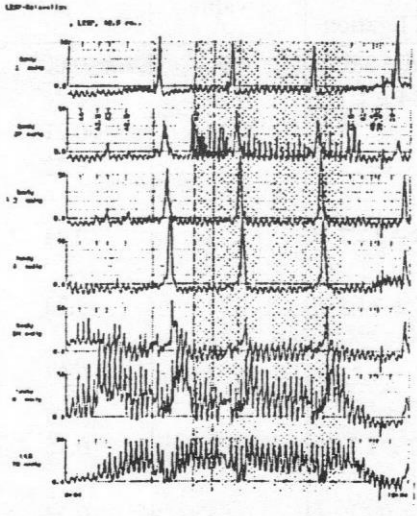

Fig. (3) : Shows esophageal motility before band ligation.

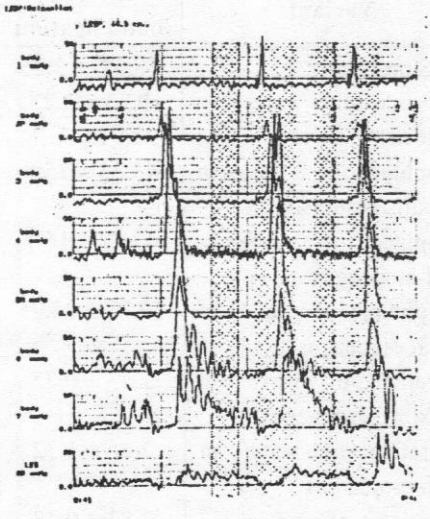

Fig. (4) : Shows esophageal motility after band ligation.

DISCUSSION

Hemorrhage from esophageal varices is a catastrophic complication of portal hypertension. Endoscopic injection sclerotherapy has been the preferred modality to manage variceal bleeding but due to its high complication rate and its damage to mucosa and submucosa of the esophagus endoscopic variceal ligation had been gained a wide popularity, which have fewer rate of complication, rapid rate of variceal obliteration and better survival [13,14]. Lo et al., 1995 concluded that ligation may replace sclerotherapy as the first choice in the management of acute variceal bleeding as well as prevention of rebleeding. Most motility abnormalities post sclerotherapy were observed in the distal one-third to one-half of the escphagus, probably because of the location of prominent variceal columns and the technique, which requires initial injection most distally in the esophagus and hence may increase reflux [6,16,17]. In contrast, many studies showed that band ligation had no or minimal effect on esophageal sphincter [9,18]. Our aim in this study is to compare between effect of sclerotherapy and band ligation on LES pressure and esophageal motility after variceal eradication.

In the present study, there is no significant difference between both groups as regard the demographic data as well as the etiology of liver pathology, which was mainly post-bilharzial and mixed cirrhosis due to the endemicity of bilhariziasis in the locality in which the study was done, this agrees with the studies done by Farag et al. (1997) and El-Sharkawy, (1996). There is failure to get complete eradication of varices in 16% of cases in band ligation group, than sclerotherapy, this because band ligation causes thrombosis and fibrosis of varices but not so dense and deep as sclerotherapy which obliterate the perforators connecting the extrinsic and intrinsic systems, this agrees with study done by Hashizume et al. (1993) and Binmoeller et al. (1994). In the band ligation group, there is significant decrease in number of sessions and the time needed for complete obliteration of varices ($P< 0.001$) than the sclerotherapy group, this resembles the study done by Stiegmann et al. (1993), Lo et al. (1995), El-Sharakawy, (1996) and Farag et al. (1997).

As regard complications in this study, there is high significant (P<

0.001) increase in chest pain in group I, than group II, while post-band ulcers, rebleeding and recurrence of varices more significantly higher in group II than group I this disagrees with the studies done by Berne et al. (1994) and Lo et al. (1995) in which band ligation had fewer ulcer and recurrence of varices than sclerotherapy. In this study survival rate is better than that recorded by Steigmann et al. (1993) and Lo et al. (1995), this was may attributed to the etiology of liver disease which was mainly alcoholic and post-hepatitic and C-Child class.

In this study there was high significant decrease in lower esophageal sphincter pressure after injection sclerotherapy (P< 0.0001), this is in agreement with El-Sharkawy, (1996) and Taha, (1998), while Grande et al. (1991), found that injection sclerotherapy had no impact on LES pressure. Also injection sclerotherapy in this study leads to significant decrease in the velocity of wave in the esophagus (P< 0.001) this agrees with the study done by Taha, (1998) and Ghoshal et al. (1998), while there is no effect on both amplitude and duration of wave in all parts of the esophagus, this disagrees with the study done by Grande et al. (1991) and Ghoshal et al. (1998), who found that sclerotherapy leads to significant increase in abnormal waves.

In our study, there was highly significant decrease (P< 0.0001) in the LES pressure after band ligation, which agrees with study done by Taha, (1998), but do's not agree with El-Sharkawy, (1996) who found that band ligation can affect percentage of LES relaxation significantly. Also in this study there is no effect on velocity of wave, amplitude and duration of wave after band ligation which agrees with El-Sharkawy, (1996) and Hou et al. (1997), while Taha, (1998) found that band ligation leads to reduction in amplitude of wave in mid and distal esophagus but no effect in the duration.

In conclusion : endoscopic variceal ligation is a good alternative method to injection sclerotherapy in the treatment of esophageal varices bleeding with lower number of sessions to eradicate varices.

Both techniques lead to lowering in LES pressure, but without dyspeptic symptoms or reflux, and this effect is transient, continue for no longer

time. Also no effect on velocity, amplitude and duration of waves in patients with band ligation.

REFERENCES

1- **Passarettis, Mazzotti G, De Franchis R. (1989) :** Esophageal motility in cirrhosis with and without esophageal varices. Scand J Gastroenterol. ; 24: 334- 8.

2- **Polish E, Sullivan BH. (1961) :** Esophagitis associated with hemorrhage from esophageal varices. Ann Intern Med.; 54: 908 – 11.

3- **Iwakiri K, Kobayashi M, Sesoko M. (1993) :** Gastroesophageal reflux and esophageal motility in patients with esophageal varices. Gastroenterol J.;4: 477- 482.

4- **Ham HB, Urbain D. (1994) :** Esophageal transit of liquid in chronic alcoholism in patients with cirrhosis. Clin Nucl Med.; 19: 809 – 12.

5- **Spence RA, Smith JA, Isaacs S, Terblanche J. (1990) :** Disturbed esophageal motility after eradication of varices by chronic sclerotherapy: a scintigraphic study. S Afr Med . J.; 77 (3) : 138 – 40 .

6- **Fass R, Landau O , Kovacs TO, Ippoliti AF. (1997) :** Esophageal motility abnormalities in cirrhotic patients before and after endoscopic variceal treatment. Am J of Gastroenterology; 92 : 721-6.

7- **Reilly JJ, Schade RR, Van Theil DS. (1984) :** Esophageal function after injection sclerotherapy: pathogenesis of esophageal stricture. Am J Surg.; 47: 85-8.

8- **Soderlund C, Thor K, Wiechel KI. (1985) :** Esophageal motility after sclerotherapy for bleeding varices. Acta Chir Scand.; 151: 249 – 53.

9- **Hou MC, Yen TC, Lin HC, Kuo BI, Chen CH, lee FY, Liu RS, et al. (1997) :** Sequential changes of esophageal motility after endoscopic injection sclerotherapy or vari-

ceal ligation for esophageal variceal bleeding. A scintigraphic study. Am j Gastroenterology; 92 : 122- 6.

10- Sarin SK, Gupta R. (1999) : Endoscopic ligation plus sclerotherapy: two plus two makes only three. Gastrointestinal Endsc.; 50: 201- 5.

11- Taha K. (1998) : Study of the effects of endoscopic variceal band ligation on esophageal motility. Master thesis, Mansoura Faculty of Medicine.

12- Stiegmann GV, Goff JS. (1993) : Endoscopic esophageal varix ligation preliminary clinical experience. Gastrointest. Endosc.; 34: 113-6.

13- Farag MF, Shiha G, Menessy A, El-Askalany H. (1997) : Is esophageal band ligation superior to injection sclerotherapy of varices. Mansoura Medical J.; 27, No. 3&4: 176- 181.

14- Farag MF, Menessy A, Tantawy S, Awad M. (1998) : long-term treatment of bleeding esophageal varices with lisinopril and sclerotherapy. Benha Medical J.; 15. No. I: 122-7.

15- Lo GH, Lai KH, Cheng JS, Hwu CH, Chang CF, Chang SM, Chiang Hu. (1995) : A prospective randomized trial of sclerotherapy versus ligation in the management of bleeding esophageal varices. Hepatology; 22: 466-471.

16- Grande L, Planas R, Lacima G, Boix J, Rose E, Esteve M, et al. (1991) : Sequential esophageal motility studies after injection sclerotherapy: a prospective investigation. Am J Gastroenterol.; 86: 36-40.

17- Diener U, Patti MG, Molena D, et al. (2001) : Esophageal dysmotility and gastroesophageal reflux disease. J Gastrointest Surg.; 5: 250-5.

18- Berner JS, Gaing A, Sharma R. (1994) : Sequelae after

esophageal variceal ligation and sclerotherapy. A prospective randomized study. Am J. Gastroenterol.; 89; 842-8.

19- **Hashizume M, Ohta M, Ueno K. (1993) :** Edoscopic ligation of esophageal varices compared with injection sclerotherapy: a prospective randomized trail. Gastrointest. Endosc.; 39: 123-6.

20- **Binmoeller KF, Vadegar HJ, Soehendra N. (1994) :** Treatment of esophageal varices. Endoscopy; 26: 42-6.

21- **Ghoshal UC, Saraswat VA, Aggawal R , Misra A , Dhiman RK , Naik SR. (1998) :** Esophageal motility and gastroesophageal reflux: effect of variceal eradication by endoscopic sclerotherapy. J Gastroenterol & Hepatol. ; 13 (10): 1033- 8.

22- **El- Sharkawy AA. (1996) :** A prospective randomized comparative study between endoscopic variceal ligation and endoscopic variceal sclerotherapy in treatment of bleeding esophageal varices. Master Thesis, Mansoura Faculty of Medicine, Mansoura, Egypt.

دراسة مقارنة بين تأثير الحقن التصلبى لدوالى المرئ والربط الحلقى على حركية المرئ بعد القضاء على الدوالى

د.فرج محمد فرج ، د. أيمن نسيم محمد منيسى
د. نبيل جاد الحق

من أقسام الباطنة وجراحة الجهاز الهضمى - كلية الطب - جامعة المنصورة

تم إجراء هذا البحث على ٩٦ مريضاً مصابين بنزيف دوالى المرئ. تم إحتجاز المرضى فى وحده القئ الدموى بمستشفى الطوارئ وتم متابعتهم بقسم الباطنة بمستشفى المنصورة الجامعى وتم تقسيم هؤلاء المرضى الى مجموعتين.

الأولى :- وتضم ٤٦ مريضاً تم علاجهم بالحقن التصلبى لدوالى المرئ.

الثانية :- وتضم ٥٠ مريضاً تم علاجهم بالربط الحلقى لدوالى المرئ.

وقد تم عمل الفحوصات الآتيه قبل وبعد الانتهاء من علاج المرضى: صورة دم كامل وظائف كبد دراسة لحركية المرئ. وقد كانت النتائج متقاربة بين المجموعتين من حيث فاعلية العلاج والأعراض الجانبية فيما عدا ان الربط الحلقى تفوق على الحقن التصلبى فى المدة وعدد مرات الربط اللازمة للقضاء على دوالى المرئ فى حين ان الحقن التصلبى يتفوق على الربط الحلقى من حيث ظهور الدوالى مرة أخرى بعد العلاج ومن حيث تأثير كلا من الحقن التصلبى والربط الحلقى على حركية المرئ لايوجد فرق بين المجموعتين حيث أن كلا منها يؤدى الى إنخفاض ضغط فتحه الفؤاد للمرئ بعد القضاء على الدوالى وبالرغم من هذا الانخفاض لم يشكو المرضى من أعراض إرتجاع فى المرئ ولكن الحقن التصلبى يؤدى أيضاً إلى إنخفاض سرعة الموجات فى المرئ.

ومن هنا نستخلص :- أن الربط الحلقى لدوالى المرئ طريقة فعاله وتؤدى الى أعراض جانبية أقل من الحقن التصلبى ولذا يمكن إستخدامها كبديل فى حالات نزيف دوالى المرئ. وكلا الطريقتين لاتؤثر تأثيراً مباشراً على حركية المرئ ولاتؤدى الى عملية إرتجاع بالفتحة السفلية للمرئ ومن ثم لاتساعد على تكرار النزيف من الدوالى الناتج من إرتجاع الحمض المعدى .